

CLAIMS

I claim:

1. An electrochemical cell, comprising:
 - a) a container housing a first electrode, said electrode defining a cavity therein;
 - b) a separator lining said cavity and abutting said first electrode; and
 - 5 c) a second electrode disposed within said separator lined cavity, said second electrode comprising zinc powder, a rheological modifier, a gelling agent, and an electrolyte absorbed by the gelling agent, said second electrode having a preassembly yield stress less than 350 N/m² and a preassembly viscosity less than 12 N·s/m² at a 2 sec⁻¹ shear rate, said preassembly yield stress is at least 20% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
- 10 2. The electrochemical cell of claim 1, wherein said second electrode's preassembly yield stress is less than 300 N/m² and greater than 100 N/m².
3. The electrochemical cell of claim 1, wherein said second electrode's preassembly viscosity is less than 11 N·s/m² at a 2 sec⁻¹ shear rate.
4. The electrochemical cell of claim 3, wherein said second electrode's preassembly viscosity is less than 10 N·s/m² at a 2 sec⁻¹ shear rate.
5. The electrochemical cell of claim 4, wherein said second electrode's preassembly viscosity is less than 9 N·s/m² at a 2 sec⁻¹ shear rate.
6. The electrochemical cell of claim 1, wherein said second electrode's preassembly viscosity is at least 15% less than the preassembly viscosity of an identical second electrode except for the absence of said rheological modifier.

7. The electrochemical cell of claim 6, wherein said second electrode's preassembly viscosity is at least 30% less than the preassembly viscosity of an identical second electrode except for the absence of said rheological modifier.
8. The electrochemical cell of claim 7, wherein said second electrode's preassembly viscosity is at least 40% less than the preassembly viscosity of an identical second electrode except for the absence of said rheological modifier.
9. The electrochemical cell of claim 1, wherein said preassembly yield stress is at least 40% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
10. The electrochemical cell of claim 9, wherein said preassembly yield stress is at least 60% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
11. The electrochemical cell of claim 10, wherein said preassembly yield stress is at least 80% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
12. The electrochemical cell of claim 1, wherein said second electrode comprises at least 60 wt % zinc powder.
13. The electrochemical cell of claim 12, wherein said second electrode comprises at least 0.30 wt % gelling agent.
14. The electrochemical cell of claim 13, wherein said second electrolyte comprises an aqueous alkaline solution.

15. The electrochemical cell of claim 1, wherein the quantity of said modifier is less than 400 ppm and greater than 10 ppm less based on the weight of the zinc powder.
16. The electrochemical cell of claim 15, wherein the quantity of said modifier is less than 100 ppm and greater than 10 ppm based on the weight of the zinc powder.
17. The electrochemical cell of claim 16, wherein the quantity of said modifier is less than 40 ppm and greater than 10 ppm based on the weight of the zinc powder.
18. The electrochemical cell of claim 17, wherein the quantity of said modifier is less than 20 ppm and greater than 10 ppm based on the weight of the zinc powder.
19. The electrochemical cell of claim 1, wherein said zinc powder comprises at least 1 weight percent zinc flakes based on the total weight of the zinc powder.
20. The electrochemical cell of claim 19, wherein said zinc powder comprises at least 2 weight percent zinc flakes based on the total weight of the zinc powder.
21. The electrochemical cell of claim 20, wherein said zinc powder comprises at least 5 weight percent zinc flakes based on the total weight of the zinc powder.
22. The electrochemical cell of claim 1, wherein at least 10 wt % of said zinc powder is sized to pass through a 200 mesh screen.
23. The electrochemical cell of claim 1, wherein said zinc powder has a bimodal distribution of particle sizes.

24. An electrochemical cell, comprising:

- a) a container housing a first electrode, said electrode defining a cavity therein;
- b) a separator lining said cavity and abutting said first electrode; and
- 5 c) a second electrode disposed within said separator lined cavity, said second electrode comprising zinc powder, a rheological modifier, a gelling agent, and an electrolyte absorbed by the gelling agent, said zinc powder comprising particulate zinc having a BET specific surface area greater than 400 cm²/g, a tap density greater than 2.8 g/cc and less than 3.65 g/cc, and a D₅₀ less than 130 microns, said second electrode having a preassembly yield stress less than 350 N/m² and a preassembly viscosity less than 12 N·s/m² at a 2 sec⁻¹ shear rate.

10 25. The electrochemical cell of claim 24 wherein said zinc powder has a KOH absorption value greater than 14%.

26. The electrochemical cell of claim 25 wherein said zinc powder has a KOH absorption value greater than 15%.

27. The electrochemical cell of claim 24 wherein said second electrode comprising a rheological modifier has a preassembly yield stress less than 300 N/m².

28. The electrochemical cell of claim 18 wherein said second electrode comprising a rheological modifier has a viscosity less than 11 N·s/m² at a 2 sec⁻¹ shear rate

29. The electrochemical cell of claim 22 wherein said second electrode comprising a rheological modifier has a viscosity less than 10 N·s/m² at a 2 sec⁻¹ shear rate

30. The electrochemical cell of claim 24 wherein the quantity of said modifier is less than 400 ppm and greater than 10 ppm based on the weight of said zinc.
31. The electrochemical cell of claim 30, wherein the quantity of said modifier is less than 100 ppm and greater than 10 ppm based on the weight of the zinc.
32. The electrochemical cell of claim 31, wherein the quantity of said modifier is less than 40 ppm and greater than 10 ppm based on the weight of the zinc.
33. The electrochemical cell of claim 32, wherein the quantity of said modifier is less than 20 ppm and greater than 10 ppm based on the weight of the zinc.
34. Process for manufacturing an electrochemical cell, comprising the steps of:
 - a) providing a container housing a first electrode, said first electrode defining a cavity therein;
 - b) inserting a separator into said cavity, said separator lining said cavity;
 - 5 c) disposing a second electrode into the separator lined cavity, said second electrode comprising zinc powder, a rheological modifier, a gelling agent, and an electrolyte absorbed by the gelling agent, said second electrode having a preassembly yield stress less than 350 N/m^2 and a preassembly viscosity less than $12 \text{ N}\cdot\text{s/m}^2$ at a 2 sec^{-1} shear rate, said yield stress is at least 20% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
- 10 35. The process of claim 34, further including the step of securing a closure assembly to said container.
36. The process of claim 34, wherein said preassembly yield stress is less than 300 N/m^2 .

37. The process of claim 34, wherein said preassembly viscosity is less than 11 N·s/m² at a 2 sec⁻¹ shear rate.
38. The process of claim 34, wherein said preassembly viscosity is less than 10 N·s/m² at a 2 sec⁻¹ shear rate.
39. The process of claim 34, wherein said preassembly viscosity is less than 9 N·s/m² at a 2 sec⁻¹ shear rate.
40. The electrochemical cell of claim 34, wherein said preassembly yield stress is at least 40% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
41. The electrochemical cell of claim 40, wherein said preassembly yield stress is at least 60% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
42. The electrochemical cell of claim 41, wherein said preassembly yield stress is at least 80% less than the preassembly yield stress of an identical second electrode except for the absence of said rheological modifier.
43. The electrochemical cell of claim 34, wherein said second electrode's preassembly viscosity is at least 15% less than the preassembly viscosity of an identical second electrode except for the absence of said rheological modifier.
44. The electrochemical cell of claim 43, wherein said second electrode's preassembly viscosity is at least 30% less than the preassembly viscosity of an identical second electrode except for the absence of said rheological modifier.

45. The electrochemical cell of claim 44, wherein said second electrode's preassembly viscosity is at least 40% less than the preassembly viscosity of an identical second electrode except for the absence of said rheological modifier.